

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a substrate;

a semiconductor chip arranged on the substrate;

5 a first electrode formed in the substrate and
connected to the semiconductor chip;

a concave portion provided on a side of the
substrate, the concave portion extending from a back of
the substrate and terminating in the substrate, and at
10 least part of the first electrode being exposed to the
concave portion; and

a metal layer formed on the at least part of the
first electrode.

2. The semiconductor device according to claim 1,
15 wherein the metal layer is short of the side of the
substrate.

3. The semiconductor device according to claim 1,
wherein the substrate is a multilayer substrate
including at least two layers.

20 4. The semiconductor device according to claim 3,
wherein the concave portion is provided in a layer
other than an uppermost layer of the multilayer
substrate.

25 5. The semiconductor device according to claim 3,
wherein the concave portion is provided in a layer
other than a multilayer including an uppermost layer of
the multilayer substrate.

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6. The semiconductor device according to claim 3, wherein the concave portion is provided in a lowermost layer of the multilayer substrate.

5 7. The semiconductor device according to claim 3, wherein the concave portion is provided in a multilayer including a lowermost layer of the multilayer substrate and excluding an uppermost layer of the multilayer substrate.

10 8. The semiconductor device according to claim 1, wherein the semiconductor chip comprises an active element.

9. The semiconductor device according to claim 1, wherein the semiconductor chip comprises an active element and a passive element.

15 10. The semiconductor device according to claim 1, further comprising sealing resin formed on the substrate, the semiconductor chip, and the first electrode.

20 11. The semiconductor device according to claim 10, wherein the sealing resin includes a magnetic substance.

25 12. The semiconductor device according to claim 1, further comprising a second electrode formed in the substrate separately from the first electrode, and the semiconductor chip being arranged on a top of the second electrode.

13. The semiconductor device according to claim 1,

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wherein the semiconductor chip and the first electrode are connected to each other through a bonding wire.

14. The semiconductor device according to claim 1,
wherein the concave portion is one of a quadrilateral
5 and a semicircle.

15. The semiconductor device according to claim 1,
which comprises a leadless package structure.

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